

What is claimed is:

1. A device for protein crystallization comprising:

a) a compartment for the placement of a protein-containing solution;
and

5 b) a cold generating unit spaced apart from and in closed fluid communication with the compartment, the cold generating unit maintaining a temperature lower than the temperature of the compartment.

2. The device of claim 1, wherein the cold generating unit is a cold finger.

10 3. The device of claim 1, wherein the cold generating unit is contained within a dewar flask.

4. The device of claim 1, wherein the compartment comprises an open vessel for
15 the placement of a protein-containing solution.

5. The device of claim 4, wherein the open vessel is a microcapillary tube or microtiter plate.

20 6. The device of claim 1, wherein the compartment comprises a sealable vacuum chamber adapted to hold a plurality of micropipette microcapillary tubes therein, each tube having a volume of approximately 100 μ L.

7. The device of claim 6, wherein the device additionally comprises a vacuum
25 pump and gauge between the cold generating unit and the sealable vacuum chamber.

8. A device for protein crystallization comprising:

an open vessel for placement of a protein-containing solution;
a vacuum tube for placement of the open vessel therein;
a vacuum pump and vacuum gage for creating and monitoring vacuum
pressure within the vacuum tube;

5 sealing means forming a seal between the open vessel and the vacuum pump;
and

 a cold generating unit spaced apart from and in closed fluid communication
with the open vessel, the cold generating unit maintaining a temperature lower than
the temperature of the open vessel.

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9. A method for forming protein crystals comprising the steps of:

 a) providing a protein-containing solution in a compartment adapted for
the placement of a protein-containing solution;

 b) creating a region of reduced temperature spaced apart from and in
15 closed fluid communication with the compartment; and

 c) drawing water vapor out of the protein-containing solution by allowing
vapor flow out of the compartment toward the region of reduced temperature
until a protein crystal is formed in the compartment.

20 10. The method of claim 9, wherein the region of reduced temperature is created
using a cold generating unit spaced apart from and in closed fluid communication
with the compartment, the cold generating unit maintaining a temperature lower than
the temperature of the compartment.

25 11. The method of claim 9, wherein the reduced temperature is an adjustable
temperature in the range of from about 20°C to about -15°C.

12. The method of claim 11, wherein the reduced temperature is below about 0°C.

13. The method of claim 9, wherein the step of drawing water vapor out of the protein-containing solution additionally comprises application of a vacuum to the compartment.

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14. The method of claim 9, wherein the step of drawing water vapor out of the protein-containing solution is conducted at a pressure of about 26 inches of Hg.

15. The method of claim 9, wherein the method is performed in a microgravity environment.

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